

CLAIMS LISTING:

1. (Previously Presented) In a communications network susceptible to packet transmission collisions, a method for combining data packets intended for transmission toward a common communications device, comprising:

at a switching device, receiving packets to be transmitted by the switching device toward destination communications devices;

sorting data packets received during a predetermined time period into groups according to which communications device the received data packets are intended to be transmitted toward;

time aligning the data packets in each of the groups using timing information associated with respective group data packets;

applying at least one pre-selected orthogonal function to the packets in each group, thereby orthogonally combining the sorted and time aligned data packets within each of the groups associated with a common communications device; and

transmitting, toward respective destination communications devices and under respective headers, the orthogonally combined packets associated with each of said groups.

2. (Original) The method of claim 1, wherein said received data packets are sorted using a MAC header of each of said received data packets.

3. (Previously Presented) The method of claim 1, wherein said received data packets are stored in different sections of a memory according to which communications device of said network the received data packets are intended.

4. (Previously Presented) The method of claim 1, further comprising sorting for transmission said orthogonally combined data packets in different sections of a memory according to which communications device said combined data packets are intended.

5. (Original) The method of claim 4, wherein said orthogonally combined data packets are stored in different sections of a memory according to which communications device of said network the combined data packets are to be transmitted.
6. (Original) The method of claim 1, wherein said orthogonally combined data packets are transmitted to an intended receiver using a single MAC header.
7. (Original) The method of claim 1, wherein a respective bandwidth required to transmit each group of said orthogonally combined data packets is substantially the same as a bandwidth required to transmit a largest data packet in each of said groups.
8. (Previously Presented) The method of claim 1, wherein said timing information comprises a time period greater than or equal to a total time latency for receiving data packets intended for a common communications device of said network.
9. (Original) The method of claim 8, wherein data packets in said network are communicated according to a global timing schedule and said time latency is due to differences in the latencies of transmission media of the communications devices of said network.
10. (Original) The method of claim 1, wherein only data packets having specific MAC headers are orthogonally combined.
11. (Original) The method of claim 1, wherein data packets not orthogonally combined are communicated in said network according to conventional Ethernet protocols.
12. (Previously Presented) An apparatus for combining data packets intended for transmission toward a common communications device in a communications network susceptible to packet transmission collisions, comprising:

a timer for defining a time period for receiving data packets using timing information associated with a specific group of data packets;

an addressing device for defining a storage location for said received data packets according to which communications device the received data packets are intended to be transmitted toward;

a memory for storing said received data packets in different sections according to the storage location defined by said addressing device, wherein the data packets stored within each of said different sections are timed aligned; and

a combiner for applying at least one pre-selected orthogonal function to the packets in each group, thereby orthogonally combining the respective time aligned data packets in each of said different sections of said memory associated with a common communications device prior to transmission of the orthogonally combined packets associated with each of said groups under respective headers toward respective destination communications devices.

13. (Original) The apparatus of claim 12, further comprising a second memory for storing said orthogonally combined data packets in different sections according to which communications device of said network the combined data packets are to be transmitted.

14. (Original) The apparatus of claim 12, further comprising a bit scaler for defining the number of bits to be combined by said combiner.

15. (Original) The apparatus of claim 12, wherein said addressing device stores information regarding the MAC header of which data packets are to be orthogonally combined.

16. (Original) The apparatus of claim 12, further comprising a Receive MAC for receiving data packets and a Transmit MAC for transmitting the respective orthogonally combined data packets to an intended communications device.

17. (Original) The apparatus of claim 12, wherein said apparatus is implemented in an interconnect switch of said network.

18. (Original) The apparatus of claim 12, wherein said apparatus is implemented in at least one of the communications devices of said network.

19. (Previously Presented) A packet network susceptible to packet transmission collisions where data packets intended for transmission toward a common communications device are combined, comprising:

- a plurality of communications devices; and

- a switch for interconnecting said communications devices, wherein said interconnection switch includes:

- a timer for defining a time period for receiving data packets using timing information associated with a specific group of data packets;

- an addressing device for defining a storage location for said received data packets according to which communications device the received data packets are intended to be transmitted toward;

- a memory for storing said received data packets in different sections according to the storage location defined by said addressing device, wherein the data packets stored within each of said different sections associated with a common communications device are respectively timed aligned; and

- a combiner for applying at least one pre-selected orthogonal function, thereby orthogonally combining the respective time aligned data packets in each of said different sections of said memory associated with a common communications device prior to transmission of the orthogonally combined packets associated with each of said groups under respective headers toward respective destination communications devices.

20. (Previously Presented) A packet network susceptible to packet transmission collisions where data packets intended for transmission toward a common communications device are combined, comprising:

a non-blocking switch for interconnecting communications devices of said network; and

a plurality of communications devices, wherein at least one of said communications devices includes:

a timer for defining a time period for receiving data packets using timing information associated with a specific group of data packets;

an addressing device for defining a storage location for said received data packets according to which communications device the received data packets are intended to be transmitted toward;

a memory for storing said received data packets in different sections according to the storage location defined by said addressing device, wherein the data packets stored within each of said different sections associated with a common communications device are respectively timed aligned; and

a combiner for applying at least one pre-selected orthogonal function, thereby orthogonally combining the respective time aligned data packets in each of said different sections of said memory associated with a common communications device prior to transmission of the orthogonally combined packets associated with each of said groups under respective headers toward respective destination communications devices.

21. (Previously Presented) The method of claim 1, wherein said timing information comprises a time period determined using a global timing schedule according to which data packets are transmitted within said communications network and a total time latency for receiving data packets intended for a communications device of said communications network.